BRITISH COLUMBIA MINISTRY OF FORESTS

Tree Farm Licence

TFL 24

Rationale for Allowable Annual Cut

(AAC) Determination

effective April 30, 1995
Larry Pedersen
Chief Forester

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- Appendix 1: Section 7 of the B. C. *Forest Act.*
- Appendix 2: Section 4 of the Ministry of Forests Act.
- Appendix 3: Minister's July 28, 1994 Letter to the Chief Forester.

- Appendix 4: Summary of Public Input.

Objective of this document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed as Chief Forester of British Columbia in making a determination, under Section 7 of the *Forest Act*, of the allowable annual cut (AAC) for tree farm licence (TFL) 24. The document also identifies priorities where new or better information is required for incorporation into future determinations. I formulated my rationale for the AAC determination documented in this rationale in March ,1995, and released the determination itself on April 28, 1995. The determination came into effect on April 30, 1995. This rationale report is a confirmation of the information before me at the time of the determination and an explanation of my rationale for that determination.

Description of the TFL

Tree Farm Licence 24, also known as the Moresby TFL, consists of two supply blocks on the upper half of Moresby Island, the more southerly of the two major islands of the Queen Charlotte Islands group. One block is centred on Mosquito Lake, at the head of Gillat Arm, while the second surrounds Sewell Inlet and includes Talunkwan Island. The TFL is held by Western Forest Products and is administered from the Queen Charlotte Islands Forest District Office in Queen Charlotte City, as part of the Vancouver Forest Region.

The total land base for TFL 24 is 53 660 hectares (ha), with a productive forest land base of 35 380 ha and a timber harvesting land base of 23 513 ha, which is 66 percent of the productive forest land or 44 percent of the total TFL area.

Most of the operable forest lies within the Coastal Western Hemlock biogeoclimatic zone. Stands containing predominantly western hemlock are most common, covering 50 percent of the timber harvesting land base, with Sitka spruce (31 percent) and Western redcedar (14 percent) also present. In contrast to other coastal forests there is no amabilis fir (balsam).

All the timber harvested on the TFL is transported by barge from the islands to processing facilities on Vancouver Island and the Lower Mainland.

History of the AAC

TFL 24, then known as Forest Management Licence No. 24, was originally awarded in 1958 to Alaska Pine & Cellulose Ltd as a 21-year licence. At that time, the licence comprised five supply blocks totalling 115 521 ha on Moresby Island and the company was authorized to harvest 212 376 cubic metres under Management Plan 1. In 1961 Alaska Pine changed its name to Rayonier Canada Ltd. That same year the licence was assigned to the company's subsidiary, subsequently known as Rayonier Canada (B.C.) Ltd.

The completion of a re-inventory in 1968 identified a 45-percent increase in net operable area from that assumed previously. Consequently, the AAC was increased to 305 822 cubic metres in 1969 and raised again to 410 594 cubic metres in 1971 as a result of the conversion to close utilization standards from the intermediate utilization standards assumed in the 1969 determination.

The timber supply analysis conducted in 1974 included lower than previous estimates of physical inaccessibility and smaller losses due to fire, insects and disease. As a result of the analysis, the harvest level was increased to 436 079 cubic metres per year. However, in 1981 the harvest level was reduced to 432 375 cubic metres per year to accommodate Forest Service concerns over terrain stability, streamside protection, wildlife protection, archaeological site protection and local aesthetics.

In 1979 a 25-year replaceable tree farm licence was issued to Rayonier, which changed its name to ITT Industries of Canada Ltd., later that same year. In 1980 it changed again to Western Forest Products Ltd., and continues under that name today although control of the company was acquired by Doman Forest Products Ltd. in 1989.

One of the most significant events in the history of the licence was the creation of South Moresby National Park Reserve in 1987, now also known as the Gwaii Haanas National Park Reserve/Haida Heritage Site. Three supply blocks and part of a fourth--covering 58 802 ha and including much of the TFL's mature growing stock--were removed from the TFL when a new licence was issued in May 1989. The anticipated loss of over 52 percent of the TFL land base to the new park resulted in a 73 percent reduction in the AAC, effective January 1, 1989. The new total AAC of 115 000 cubic metres also included a Small Business Forest Enterprise Program component of 10 335 cubic metres. That AAC remains in effect today under Management Plan No. 6.

New AAC Determination

Effective April 30, 1995, the AAC for TFL 24, including Schedule A private lands and Schedule B land in the Small Business Forest Enterprise Program, will be 115 000 cubic metres. This will remain in effect until a new AAC is determined, which must take place within five years of this determination.

Information Sources Used in the AAC Determination

Information considered in determining the AAC for TFL 24 includes the following:

TFL 24 Draft Management Plan 7, (MP No. 7) dated December 20, 1994;
Statement of Management Objectives, Options and Procedures for Management Plan 7, dated January 14, 1991;
Western Forest Products' Timber Supply Analysis Report for TFL 24, Management Plan 7, dated June 1991 (revised August 1994);
B.C. Forest Service Supplementary Timber Supply Analysis for TFL 24, Management Plan 7, dated June 15, 1994;
Letter from the Minister, dated July 28, 1994, stating the Crown's economic and social objectives;
Technical review and evaluation of current operating conditions through comprehensive discussions with Forest Service staff.

Role and limitations of the technical information used

The *Forest Act* requires me as Chief Forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis and the inventory and growth and yield data used as inputs to the analysis formed the major body of technical information used in my AAC determination for TFL 24. The timber supply analysis is concerned primarily with biophysical factors--such as the rate of timber growth and definition of the land base considered available for timber harvesting--and with management practices. The analysis also indirectly incorporates some economic information such as an operability classification that defines the types of terrain and timber that can be physically and economically accessed given current technology and markets.

However, the analytical techniques used to assess timber supply are simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variation in physical, biological and social conditionsalthough ongoing science-based improvements in the understanding of ecological dynamics will help to reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural, and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide the complete answer or solution to forest management problems such as AAC determination. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information I must consider in AAC determinations.

The preparation and review of MP No. 7 has been delayed and protracted over 4 years. This has resulted in a number of the components of the information considered as part of this determination being old and containing deficiencies. I have taken this into consideration and, as discussed under "Reasons for Decision" below, I have attached certain conditions in my approval letter for MP No. 7.

In making the AAC determination for TFL 24, I have considered the limitations of the technical information provided.

In particular, I have taken the following into account.

The inventory information for the TFL is based upon a 1968 forest cover inventory updated to 1989. This inventory information and therefore the harvest forecasts of the timber supply analysis do not reflect the six years of harvesting that have occurred since the inventory information was prepared. This is discussed under section 7(3)(a)(i) below.

The method used in the timber supply analyses to account for the management of visually sensitive areas, as discussed under section 7(3)(a)(v) below, did not include a TFL landscape inventory.

Inventories and mapping of a number of forest resources and attributes such as environmentally sensitive areas and operability are incomplete or out of date. This is discussed further under sections 7 (3)(a)(i) and 7(3)(a)(v) below.

Statutory Framework

Section 7 of the *Forest Act* (revised 1992) requires the Chief Forester to consider various factors in determining AACs for TFLs. Section 7 is reproduced in full as Appendix 1.

Guiding Principles

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. Two important ways of dealing with uncertainty are (i) minimizing risk, and (ii) redetermining AACs frequently to ensure they incorporate up-to-date information and knowledge. In respect of these: (i) in making AAC determinations I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with AACs from a range of possible harvest levels; and (ii) the benefits of frequent decision making have been recognized in the legislated requirement to redetermine AACs every five years. This principle is central to many of the guiding principles that follow.

In considering the various factors that Section 7 of the *Forest Act* requires me to take into account in determining AACs, I attempt to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the timber supply--such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance--or to factors that could work to reduce the timber supply--such as integrated resource management (IRM) objectives beyond those articulated in current planning guidelines.

The impact of the Forest Practices Code on timber supply is a matter of considerable public concern. In determinations to date, including that for TFL 24, which were made prior to implementation of the Code, which began on June 15, 1995, no final regulations or standards were available at the time of analysis to assess the impact of any new constraints on timber production which might be imposed under the Code. In this determination I have not considered any more stringent restrictions or additional impacts upon timber supply beyond those anticipated to occur due to the application of current guidelines which were in place at the time when this determination was made and released.

The impact on the timber supply of land use decisions resulting from planning processes such as the Commission on Resources and Environment (C.O.R.E.) process or the Land and Resource Management Planning (LRMP) process is a matter often raised in discussions of AAC determinations. In determining AACs it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from land-use decisions that have not yet been taken by government. Thus I do not consider the possible impacts of existing or anticipated recommendations made by such planning processes, nor do I attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made land-use decisions, it may not always be possible to analyze their timber supply impact in an AAC determination. In most cases, government's land-use decision must be followed by detailed implementation decisions. For example, a land-use decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made, it is impossible to properly assess the impact of the land-use decision. However, the legislated requirement for five-year AAC reviews will ensure such decisions are addressed.

The Forest Renewal Plan will fund a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. In general, it is too early for me to assess the consequences of these activities, but wherever appropriate I will take their effects into account. The next timber supply review will be better positioned to determine how the Plan may affect the short- and long-term timber supply.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data has created the extensive delays that have resulted in the current urgency to redetermine many outdated AACs. In any case, the data and models available today are superior to those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, I should immediately reduce some AACs in the interests of caution. However, any AAC determination I make must be the result of applying my judgement to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations issues, I am aware of the Crown's legal obligations resulting from the June 1993 Delgamuukw decision of the B.C. Court of Appeal regarding aboriginal rights. The AAC I determine for a TSA should not in any way be construed as limiting the Crown's obligation under the Delgamuukw decision, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within the TSA and that it is independent of any decision by the Minister of Forests with respect to subsequent allocation of the wood supply. Specific identified activities in traditional areas will be taken into account as far as possible under section 7(3)(a)(v) of the *Forest Act*, and these will be respected in the administration of the AAC determined.

Regarding future treaty decisions, as with other land-use decisions it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia, and of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act* (attached as Appendix 2).

Timber Supply Analysis

The timber supply analysis for TFL 24 was undertaken by the licensee and reviewed by Forest Service staff. The timber supply model used by Western Forest Products for its harvest projections was TRIM (Timber Resource Inventory Model), a simulation model developed in the United States by P.L. Tedder, J.C. Gourley and R.N. Lamont in 1986. With specific qualifications discussed under section 7(3)(a)(i) below, I accept that the information generated by this model is comparable with information generated by the BC Forest Service simulation model and provides a reasonable projection of timber supply.

The Western Forest Products analysis examined six different management regimes. In addition to a base option intended to represent the management regime currently practiced on the TFL by Western Forest Products, changes were examined both to the definition of the timber harvesting land base and to management objectives. Pure alder stands were included in the timber harvesting land base as part of an alder management option and the unconventional harvest areas were included in the timber harvesting land base as part of an unconventional harvest systems option. Sensitivity analysis was also used to examine the effect of harvesting at the age of culmination of mean annual increment rather than using a minimum d.›meter target; the effect of doubling the regeneration delay; and the effects of changes in

assumptions about visual quality objectives.

Under the basic option, referred to in this document as the base case, a timber harvesting land base of 23 513 ha supports an initial harvest rate of 115 000 cubic metres per year for the first decade. Following this, the harvest level declines by 14 percent to 99 965 cubic metres per year where it remains for 6 decades. It then begins an increase in decade 8 to the long-term harvest level of 182 095 cubic metres per year, reached in decade 12. The reduced harvest level projected for decades 2 through 7 results from a shortfall in timber supply approximately 40 to 60 years from now due to the past concentration of harvest operations in the northern half of the TFL and to the age-class imbalance created by the removal of South Moresby National Park Reserve.

The BC Forest Service conducted a supplementary timber supply analysis using information provided by Western Forest Products. Reasons for undertaking this analysis included the fact that the time taken in preparing and reviewing MP No. 7 resulted in the analysis prepared by Western Forest Products becoming somewhat dated, and the fact that the timber supply model used by the licensee at that time was not capable of simulating forest cover requirements explicitly. The Forest Service analysis included a variety of additional sensitivity analyses that I will describe below in my considerations under the appropriate sections. Both analyses contributed to my considerations in this determination.

Consideration of Factors as Required by Section 7 of the B. C. *Forest Act*

Section 7 of the *Forest Act* requires the Chief Forester to consider various factors in determining AACs for TSAs and TFLs. These factors are listed by subsection and considered immediately below, and Section 7 is appended in full as Appendix 1.

> **Section 7 (3)**
>
> **In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall consider**
>
> > **(a) the rate of timber production that may be sustained on the area, taking into account**

7(3)(a)(i) the composition of the forest and its expected rate of growth on the area

Forest land base contributing to timber harvest.

-- Reductions to account for environmentally sensitive areas

A review of the licensee's terrain reports by Queen Charlotte Forest District staff resulted in concerns that environmentally sensitive areas (ESAs), especially sensitive soils, are not adequately accounted for. The incidence of natural mass wasting is higher in the Queen Charlotte Islands than in most other parts of the province, due to the unique geological history of the area, and consequently most of the ESAs in the TFL are classified primarily on the basis of soil stability. The licensee's ESA information is based on 1979 road-building information that has been converted to a terrain classification, but which results in

information that does not meet current standards for terrain classification.

Western Forest Products itself is concerned about the terrain classification information and, as discussed under section 7(3)(a)(v) below, has committed to completing an ESA inventory by the end of 1996. I have also discussed there the need for completion of this inventory in time for the next timber supply analysis for TFL 24. For this determination, immediately below I have considered the possible implications of uncertainty about ESAs as these relate to operability and the size of the land base that can be expected to be available for timber harvesting.

-- Operability

As discussed under 7(3)(a)(vi) below, Queen Charlotte Forest District staff reviewed the operability information provided by the licensee for the whole TFL in conjunction with the 20-year plan. The operability mapping, which was based on preparation that began in 1981, was rejected for a number of reasons. Low-productivity growing sites were included in the conventional timber harvesting land base to a larger degree than was represented in recent harvesting performance. Identified riparian areas, unstable soil areas or ESAs, and areas requiring unconventional harvesting methods, were also included in the conventional timber harvesting land base.

As a result of their review, forest district staff believe the conventional timber harvesting land base may be overstated in the analysis by as much as 20 percent. It is believed that since the ESA inventory and mapping do not adequately reflect unstable soils, the operability information does not accurately reflect the area that can be harvested using conventional means. There are also concerns that existing operability information does not account adequately for areas that will prove inaccessible because surrounding areas cannot sustain road building.

In the operability information incorporated into the 20-year plan it was proposed that within a 15-year period harvesting operations would move back onto Talunkwan Island (where there are currently mostly immature stands and a very high incidence of slope failure) and also into Fairfax, Newcombe and Botany Inlets, where the potential for road construction is also questionable.

It is reasonable to expect that some areas classified as inoperable by conventional means are actually operable and vice versa. Two-and-one-half percent of the licensee's harvesting between 1987 and 1991, using conventional harvesting techniques, was conducted on areas classified as inoperable for conventional equipment. The licensee believes this exemplifies the uncertainty about the operability classification. Although this is a very small area, I accept that there is some degree of uncertainty associated with the operability classification. Nevertheless, the Forest Service sensitivity analysis indicates that a conventional timber harvesting land base as much as 20 percent smaller than assumed would not necessarily affect the initial harvest level, given the harvest flow objectives inherent in timber supply modelling. I am therefore satisfied that the observed small difference between operability as experienced and operability as assumed in the analysis does not affect the short-term timber supply. Nevertheless, as discussed under section 7(3)(a)(v) below, I hold the licensee to its commitment to reassess operability in the preparation of MP No. 8.

-- Unconventional harvesting areas

There are approximately 3500 ha of unconventional harvesting area within the TFL. Harvesting in these areas could provide significant relief to the timber supply shortfall projected to occur in 40 to 60 years as discussed below in section 7(3)(d).

The Western Forest Products timber supply analysis indicates that an increase in short-term timber supply is possible if unconventional harvesting techniques such as the use of helicopters, long-lines and A-frames are employed. The licensee has proposed that these areas not be considered part of the timber harvesting land base until the licensee has developed more expertise in the field of unconventional harvesting techniques and has completed a review of the environmental and technological operability mapping, as discussed under section 7(3)(a)(v) below. Western Forest Products now has 4 years of experience in helicopter logging in the South and Mid Coast, and the forest development plans for TFL 24 submitted by the licensee include cutblocks located in unconventional harvesting areas. As discussed under 7(3)(d) below, the timber supplies associated with unconventional harvesting areas likely will be a significant factor in the next AAC determination. Thorough consideration of unconventional harvesting will require completed operability mapping and demonstrated performance with the identified range of unconventional operations. For these reasons, I have specified certain conditions in my letter approving MP No. 7.

-- Reductions to account for riparian habitat

The timber harvesting land base was reduced by 477 ha to account for B.C. Coastal Fish/Forestry Guidelines and the existing mapping of areas along streams having fish-spawning and highly productive rearing areas. These areas are also known as Streamside Management Zones and are highly sensitive to timber harvesting. B.C. Coastal Fish/Forestry Guidelines require a 30 metre reserve strip on both sides of class 1 and 2 streams for the protection of spawning grounds and riparian habitat.

The Department of Fisheries and Oceans has expressed concerns that important, but less sensitive fish habitat, Ef2, has not been identified in mapping and inventory exercises and has not been accounted for in the timber supply analysis. Areas categorized as Ef2 are areas containing braided stream channels and flood plains that are suitable for spawning and fish rearing, also known as Fisheries Sensitive Zones. As noted under section 7(3)(a)(v) below, MP No. 7 includes the commitment to complete a comprehensive strategy for fisheries enhancement and protection on TFL 24 including a stream classification for all streams in the TFL during the period of MP No. 7.

-- Reductions to account for mixed coniferous/deciduous stands

Areas covered by pure deciduous stands (944 ha) were not included in the timber harvesting land base. However, an additional 741 ha (3 percent of the timber harvesting land base) covered by stands composed of a mixture of deciduous and coniferous species, are included in the timber harvesting land base. Recent operations in deciduous types that have raised questions about their economic viability, and the absence of an explicit commitment in MP No. 7 to harvest these mixed stands, give me concern that the timber harvesting land base may have been overestimated by the inclusion of these stands. Timber supply analysis indicates that whether or not harvesting occurs in these stands, the short-term timber supply remains the same. However, I wish to emphasize the importance of the contribution that the stands on these areas are expected to make to the middle- and long-term timber supplies.

Existing inventory information

-- General comments

The last complete timber inventory was conducted in 1968, followed by a second-growth inventory in 1987. For the purposes of the timber supply analysis, the inventory information was updated to reflect harvesting and planting up to January 1, 1989. This is important because the harvest operations that have occurred since 1989 are not reflected in the inventory information or the timber supply analyses.

Therefore, the same timber volume that has been harvested over the last 6 years is assumed to support the harvests projected in the first decade of the timber supply analysis.

This inventory information is relatively old, and I am aware that inventory standards have changed since it was compiled. It is, however, the best information currently available for use in this determination and, as discussed below, sensitivity analysis indicates that short-term timber supply is not sensitive to a number of the factors recorded in the inventory. I also note that as part of MP No. 8, a timber re-inventory that makes use of new vegetation inventory standards will be conducted.

-- Age class structure

As discussed above, the creation of the South Moresby Park Reserve in 1989 resulted in the withdrawal of over half of the TFL land base. Most of this area was covered by mature stands. As a result, about 30 percent of the current operable land base is mature, 66 percent is immature, and the remaining 4 percent is not satisfactorily restocked (NSR). There are currently virtually no stands between the ages of 60 and 120 years. This imbalance in the age class distribution is one of the most significant factors influencing the timber supply shortfall projected to occur approximately 40 to 60 years from now. However, as discussed under section 7(3)(a)(iii) below, this age class structure also presents opportunities for commercial thinning operations which may help to offset the projected shortfall.

-- Volume estimates for existing stands

Volume-ratio sampling, the comparison of inventory growth and yield information with sample plot information, is scheduled to be conducted in 1998. At this time Queen Charlotte Forest District staff have no information to lead them to suspect that the existing inventory volumes are either too high or too low. The existing inventory information represents the best information for existing stands currently available, and I am satisfied that it is acceptable and appropriate for use in my determination.

-- Ecosite classification

Site indexes in TFL 24 are assigned according to a Western Forest Products ecosite classification system completed in 1982. In 1991, this system was reviewed by the Forest Service's Research Branch and was considered acceptable for use during the term of MP No. 7. In view of the subsequent delays in the preparation and review of MP No. 7, Research Branch reviewed the system again. The system was again accepted, but the Branch expressed concerns about the statistical validity of the system and recommended additional studies be completed and included in MP No. 8.

Given the large amount of research and development in ecosystem and biogeoclimatic classification systems over the last decade, it is not unreasonable to expect a continued evolution and refinement of the ecosite classification system used for TFL 24. Taking this and the recommendations made by Research Branch into consideration, I believe the site indexes used in the timber supply analyses are satisfactory for use in this determination. I am also satisfied, from the results of sensitivity analysis examining reduced regenerated stand volumes, that short-term timber supply is not sensitive to an overestimation of site index. However, I wish to emphasize the importance of site productivity to estimates of future yields and the age at which second-growth stands can be reasonably expected to be available for harvest. It is important that studies recommended by Research Branch be completed as part of the preparation of MP No. 8. For this reason, I have specified certain conditions in my approval of MP No. 7.

-- Cedar conversion site index adjustment

As discussed under section 7(3)(a)(ii) below, western redcedar plantations on TFL 24 are browsed heavily by deer. In order to combat this problem the licensee has committed to replanting harvested cedar sites with spruce and hemlock. Associated with this conversion, the licensee proposed an increase in site index estimates in the range of 3 to 6 metres to reflect their contention that on the same site, spruce and hemlock grow more rapidly than cedar. Timber supply analysis indicates that this site index adjustment on all proposed conversion sites amounts to a long-term increase of 6680 cubic metres per year. The approach used to model this in the timber supply analysis does not reflect the commitments of the management plan exactly and results in an overestimated timber supply. The licensee's proposed site index adjustment was not substantiated by statistically valid information and therefore was not accepted by Research Branch.

Moreover, there are limitations to the degree to which cedar conversion may occur on all sites due to concerns about biodiversity and the ecological suitability of species conversion. As a result, only about half of the cedar sites are being converted to spruce and hemlock stands. The commitments of the management plan, the assumptions modelled in the timber supply analysis, and the actual practices are not consistent.

While I feel that some adjustment to site index is appropriate, as a result of actual stand conversion, the degree and effect of this adjustment is not well quantified, and from the results of the timber supply analysis it is clear that the short-term timber supply is not affected by these adjustments. I expect future analysis will address this issue more thoroughly and to ensure this I have specified certain conditions in my approval letter.

Other commitments in MP No. 7 to combat deer browsing are discussed under section 7(3)(a)(ii) below. These techniques may be preferable to the species conversion discussed above, in light of the limitations to cedar conversion arising from concerns about biodiversity and ecological suitability.

-- Volume projections for regenerated stands

Projected regenerated stand yield estimates are substantially higher (approximately 38 percent on average) than the average volume per hectare estimates for the remaining old-growth stands on TFL 24. The growth and yield tables used to project the volume estimates for future stands on TFL 24 were developed by Western Forest Products and reviewed by Research Branch in July 1991, then reaffirmed in February 1994. The volume estimates from these tables are comparable to Forest Service yield projections for similar stands. The wide discrepancy between volumes for existing and future stands is attributable to the fact that the remaining old-growth species profile has a lower average productivity than the rest of the TFL and that the growth of future stands is projected to be enhanced through silvicultural practices.

Sensitivity analysis indicates that even if the timber volumes of second-growth stands are 30 percent lower, the timber supply projected for the first decade is unaffected. I am therefore satisfied that any uncertainty in the regenerated stand volume estimates used in the timber supply analyses is of insufficient consequence to affect this determination.

-- Minimum harvest ages

Minimum harvest ages on TFL 24 were established at the age at which trees reach at least a 45 centimetre diameter at breast height, which Western Forest Products considers necessary for harvesting to be feasible economically. The minimum diameter assumption is based on a 1988 economic analysis conducted by the licensee, showing that the logging of stands of smaller than 45 centimetres in average

diameter at breast height was unprofitable for them. This results in minimum harvest ages ranging from 55 to 160 years, depending on species, site productivity and stand management practices. It is my observation that there are many factors which affect the economic viability of operations, and these often change over time. For the purposes of the analysis, trees on low-productivity sites that were not projected to reach 45 centimetres in diameter at breast height in 200 years were assumed to be harvested at 160 years old. Since this is inconsistent with the current 45-centimetre requirement, I have some concern that the long-term harvest level could be somewhat lower than projected. Moreover, if some of the trees currently standing on these sites are less than 45 centimetres in diameter, the mid-term level could be affected, although sensitivity analysis indicates that exclusion of these low-productivity sites would not restrict the short-term supply. Nevertheless, as discussed further under Timber supply profile, the integrity of the harvest forecast is dependent upon performance in the low- and very-low productivity sites that are included in the timber harvesting land base, and I therefore hold the licensee accountable for proving performance in these areas.

The Forest Service's sensitivity analysis indicates that the initial harvest level can be increased to 122 500 cubic metres per year and maintained for 6 decades before increasing to the long-term harvest level if minimum harvest ages are reduced by 10 years. Western Forest Products' sensitivity analysis, making use of a non-declining harvest flow, examined minimum harvest ages established at culmination age. In this sensitivity analysis, the initial harvest level of 135 000 cubic metres per year can be maintained for 9 decades. This indicates that the timber supply is very sensitive to uncertainty in minimum harvest age and hence the minimum diameter requirements have a significant influence on the timber supply available 20 to 60 years from now. Opportunities to reduce the minimum harvest age through aggressive investment in juvenile spacing are discussed under 7(3)(a)(iii) below.

As discussed under 7(3)(d) below, it may be possible to develop a more strategic management plan that makes use of the existing age class structure and addresses minimum diameter requirements to alleviate short- and mid-term timber supply shortfalls.

7(3)(a)(ii) the expected time that it will take the forest to become re-established on the area following denudation;

Regeneration delay

The Western Forest Products timber supply analysis reflected the commitments of MP No. 7 in assuming regeneration delays of 3 to 5 years. These are comparable with regeneration delays in adjacent management units, and I consider these values to be reasonable and appropriate for use in my determination.

Impediments to prompt regeneration

As discussed above under *site index,* western redcedar plantations on TFL 24 are browsed heavily by deer. MP No. 7 commits to the use of 2.5-metre fencing around cutblocks, vexar netting around individual planted trees, systemic repellents in planting stock, external deer repellents and the active encouragement of hunting in heavily browsed areas.

I encourage the use of these techniques in addition to the species conversion discussed under *site index* above, in order to strike a suitable balance of practices given the ecological limitations of species conversion on cedar sites.

Not satisfactorily restocked areas

The total area considered not satisfactorily restocked (NSR) is roughly equivalent to the area harvested on the TFL during a three-year period, with very little backlog NSR. MP No. 7 commits to restocking all backlog NSR more than 5 years old, by the end of 1995. Since current NSR areas are consistent with assumed regeneration delays, I am satisfied that no adjustment to the projected timber supply is required on this account.

7(3)(a)(iii) silvicultural treatments to be applied to the area;

Juvenile spacing

Over the last 5 years, approximately 370 ha per year of TFL area occupied by juvenile stands have been spaced (a total of 1577 ha). MP No. 7 includes the commitment to conduct as much juvenile spacing as is funded by provincial and federal initiatives--currently 600 ha per year. The licensee expects to reduce the objectives of the spacing program over the next 5 years from 370 ha per year to about 200 ha per year. This is of concern to me, as discussed below.

For stands that have already been spaced, growth and yield projections are made using managed stand yield tables for spaced stands. As discussed under 7(3)(a)(i) above, this information indicates that the juvenile stands that have been spaced will be of a large enough diameter for harvesting at an earlier age. The timber supply shortfall projected to occur on TFL 24 approximately 40 to 60 years from now could be offset somewhat by an increase in the number of stands that are juvenile spaced, thus reaching harvestable dimensions sooner. As discussed under 7(3)(d) below, it may be possible to develop a more strategic management plan for timber supply on TFL 24, that makes use of the existing age class structure and addresses minimum diameter requirements, to alleviate short- and mid-term timber supply shortfalls. If the licensee's analysis regarding economic and merchantable piece size remains as an important goal and a reasonable approximation of management objectives, then the licensee's expectation to reduce the amount of area for which juvenile stands will be spaced is of concern to me. Given the above, spacing of juvenile stands should be viewed as an important tool to assist in the attainment of economic timber supply objectives and it is therefore logical to contemplate an *increase* in juvenile spacing in order to realize opportunities to reduce harvest ages and decrease the projected shortfall. I expect the licensee to further reconcile these objectives over the course of MP No 7, and I expect this matter to be clarified for the next AAC determination.

Commercial thinning

As discussed above, the current age class structure of the forests of TFL 24 present opportunities for commercial thinning. However, the licensee has no current plans to conduct commercial thinning operations. Instead, MP No. 7 includes a commitment to conduct a feasibility study of commercial thinning opportunities during the period of MP No. 7.

The additional timber supply that could be potentially be made available through the implementation of commercial thinning may assist in reducing the timber supply shortfall projected to occur approximately 40 to 60 years from now. Although the thinnings themselves are not expected to contribute significantly to timber supply, they could allow the remaining stand to be harvested at an earlier age. The opportunity for commercial thinning is noted further under section 7(3)(d) below.

Fertilizing and pruning

Neither the Western Forest Products' nor the Forest Service's timber supply analysis modelled the fertilization of forest stands. However, the licensee is pursuing funding to ensure that all spaced stands are fertilized. In 1992 the licensee fertilized 1300 ha of immature stands which had been previously spaced. MP No. 7 commits to pursuing funding to ensure that all spaced stands receive at least one fertilization treatment. The licensee initiated pruning in 1994, with the goal of pruning 150 ha per year, subject to the availability of funding.

Sensitivity analysis indicates that pruning and fertilizing programs of this small magnitude do not have a bearing on the projected initial harvest level.

Conversion and rehabilitation programs

As discussed with concerns noted under 7(3)(a)(i) above, the licensee has proposed the conversion of cedar stands to other more deer-resistant species, and that sites currently occupied by red alder stands be harvested and replanted with coniferous species, subject to the availability of funding and approval from appropriate resource agencies. Proposals for stand conversion may be developed under Forest Renewal BC. MP No. 7 includes a proposal to treat 50 ha of alder stands, subject to available funding.

Western Forest Products' timber supply analysis includes an examination of the implications of rehabilitating all of the area (944 ha) covered by pure deciduous stands that were deducted from the timber harvesting land base in the analysis. This sensitivity analysis, which shows that the projected short-term harvest levels are insensitive to the treatment of deciduous stands, coupled with the marginal economic feasibility noted during recent deciduous harvest operations, leads me to conclude that neither the conversion nor rehabilitation programs proposed by the licensee are likely to significantly affect the short-term timber supply. A change in market conditions may make the rehabilitation of deciduous stands profitable, and assist in offsetting some of the shortfall projected to occur approximately 40 to 60 years from now. However, the greatest benefit of the deciduous rehabilitation program appears to be the potential for establishing coniferous stands on these sites, which would then contribute to or enhance the long-term timber supply.

7(3)(a) (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area;

Utilization standards and compliance

MP No. 7 commits to complying with the utilization standards specified in cutting permits. The timber supply analyses modelled different standards for existing and regenerated stands. Standards for existing mature stands require that all trees of at least 17.5 centimetre diameter at breast height be harvested and removed from the site; that no stumps be taller than 30.0 centimetres and that all tree tops 15.0 centimetres or larger in diameter be removed from the site. Standards for regenerated stands require the same maximum stump height but require that trees of a smaller diameter, 12.5 centimetre diameter at breast height, be harvested and removed from the site and that all tree tops 10.0 centimetres or larger in diameter be removed from the site. The management plan commitments and the standards modelled are reasonable in my opinion and acceptable for use in this determination.

Decay, waste and breakage

The yield tables used by Western Forest Products to project stand growth and yield incorporate factors for decay, waste and breakage which are comparable with the yield tables and estimates of decay, waste and breakage used and accepted by the Forest Service. I am satisfied that the harvest levels projected in the timber supply analyses adequately account for decay, waste and breakage.

7(3)(a)(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production;

Integrated Resource Management (IRM) objectives

The Ministry of Forests is required by the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown, having regard to the immediate and long-term economic and social benefits, and, in consultation and cooperation with other agencies, to plan, coordinate and integrate the use of a variety of forest-related resources. The extent to which integrated management objectives for various forest resources and values constrain the timber supply must be considered in AAC determinations.

-- Resource inventories and assessments

There are a number of inventories and assessments about the forest which require completing or updating. These include a soil stability assessment, hydrological assessment, wildlife habitat inventory, stream classification, archaeological site inventory, biodiversity assessment, and a total resource plan. I hold the licensee to its commitments in MP No. 7 to complete and update this information for use in the preparation of MP No. 8, and I emphasize the importance of this information to the next AAC to be determined for this TFL. For these reasons I have specified certain conditions in my approval letter.

The inventory of environmentally sensitive areas is of particular concern as discussed under 7 (3)(a)(i) above. Sensitive soils, riparian areas and recreation have not been adequately accounted for and no reductions have been made to the timber harvesting land base to allow for wildlife habitat. I expect the licensee to complete the inventories associated with these forest resources in accordance with commitments in MP No. 7 and in consultation with the Ministry of Environment, Lands and Parks and the Department of Fisheries and Oceans.

-- Cutblock adjacency

Western Forest Products describes cutblock adjacency on TFL 24 by the requirement that at any time no more than 30 percent of the timber harvesting land base may be under cover of stands younger than 15 years old. These forest cover objectives roughly approximate a three-pass harvesting system. However, the Forest Service indicates that the spatial and temporal distribution of cutblocks within TFL 24 may more closely resemble a four-pass system. This would require that at any time a maximum of 25 percent of the area may be covered by stands younger than 15 years of age. Because the Timber Resource Inventory Model (TRIM) did not account explicitly for forest cover constraints, an examination of the analysis outputs was undertaken. The examination indicated that the four-pass forest cover objectives can be achieved at the harvest levels indicated in the base case harvest forecast. The Forest Service analysis explicitly modelled the four-pass forest cover objective. The results indicate that the objectives can be achieved at the harvest levels indicated in the base case harvest forecast. Further sensitivity analysis conducted by the BC Forest Service indicates that the initial harvest level is not sensitive to a more constraining five-pass system.

I am satisfied from the results of the analyses that any uncertainty about objectives for cutblock adjacency will not affect the harvest levels projected in the base case harvest forecast.

-- Visually sensitive areas

One of the resources required by the *Ministry of Forests Act* to be managed by the Ministry of Forests is outdoor recreation, which is defined under the *Forest Act* to include scenic features. Visual landscape foresters in B.C., in collaboration with specialists in other parts of the world, have developed procedures for identifying and managing visually sensitive areas. These procedures incorporate both biophysical and social factors--including visual sensitivity ratings, numbers of viewers and their perceptions, and others--and provide recommended visual quality objectives (VQOs) for visually sensitive areas.

To meet a given set of objectives, constraints are placed on timber harvesting, road building and other forest practices in the sensitive areas. These constraints are based on research and experience, and on public preferences and acceptance of degrees of alteration of visual landscapes. The constraints are expressed in terms of "forest cover" requirements which relate to the maximum allowable percentage of a landscape unit that can be harvested at any one time, and to "visually effective green-up" i.e. the stage at which regeneration is perceived by the public as newly established forest.

At the time Western Forest Products' timber supply analysis was conducted, the landscape inventory of visually sensitive areas was not complete, so the licensee accounted for the management of visual quality in the timber supply analysis by assuming that visual quality objectives in total for TFL 24 were the same as those for the Mid Coast TSA. The objectives for the Mid Coast TSA require that one-quarter of the timber harvesting land base be managed for partial retention objectives. In TFL 24 this means allowing at any time no more than 10 percent of the partial retention area to be under cover of stands younger than 15 years of age. The remaining three-quarters of the timber harvesting land base is managed for modification objectives (allowing at any time no more than 30 percent of the modification area to be under cover of stands younger than 15 years of age). An examination of the TRIM model output indicates that the objectives for the partial retention visual quality areas were not met in the short or mid terms.

The Forest Service's analysis modelled the same forest cover objectives but made use of current analytical procedures which account for the forest cover provided by inoperable areas. This resulted in objectives for the partial retention area that allow no more than 14 percent of the area to be under cover of stands younger than 15 years of age. Objectives for the modification area allow no more than 28 percent of the area to be under cover of stands younger than 15 years of age. Forest Service sensitivity analysis also examined the effect of managing a larger portion, 35 percent, of the land base for the more restrictive, partial retention objectives. The sensitivity analysis indicates that the projected short- and long-term harvest levels are virtually the same whether 25 percent (as in the base case) or 35 percent of the timber harvesting land base is managed for partial retention objectives. This indicates that any uncertainty about visual quality objectives does not have a bearing on short-term timber supply.

I am satisfied that the objectives established by the licensee in MP No. 7 for the management of visually sensitive areas are reasonable and acceptable for the term of MP No. 7 and for use in this determination.

I am aware that concerns were expressed by the public about objectives for visual quality in TFL 24, similar to concerns expressed by the public about visual quality objectives in other parts of the province. I encourage the licensee to address the objectives for visual quality in the public involvement associated with the preparation of MP No. 8. I also hold the licensee to its commitment to prepare a plan for the visual quality objectives of areas of the TFL along the main water accesses to South Moresby National

Park Reserve.

-- Biodiversity

Specific allowances for management objectives for biological diversity such as forest ecosystem networks were not made in either MP No. 7 or the Western Forest Products analysis--nor were they required. However, MP No. 7 does include a discussion of options for sustaining biodiversity on TFL 24 and identifies concern that options for managing this resource are affected by ongoing harvesting; therefore there is some urgency associated with the need to develop an acceptable biodiversity strategy. As a consequence, MP No. 7 includes a commitment to prepare a biological diversity plan that incorporates the intent of the *Guidelines to Maintain Biological Diversity in Coastal Forests, December 1992* during the term of MP No. 7. The Forest Practices Code likely will provide additional guidance on this matter. I expect a biodiversity plan as part of MP No. 8 will provide adequate information about this resource for consideration in the next AAC determined for this TFL.

For the purposes of this determination, I am unable to project the future implications for timber supply of managing biodiversity on TFL 24. However, I am satisfied from the results of both timber supply analyses, which show relatively stable and insensitive short-term timber supply, that in the short term, the amount of available timber can accommodate integrated resource management objectives and still allow harvest levels to be maintained as indicated in the base case harvest forecast. Furthermore, noting the licensee's commitment to employ the 1992 biodiversity guidelines through the term of MP No. 7, the age-class balance projected over the next five-year period, and the likelihood that forest practices will provide further guidance on this matter, I am satisfied that there is sufficient flexibility in the analysis and the plan to ensure this factor is recognized and managed appropriately. I hold the licensee to its commitment to finalize a biodiversity plan for TFL 24 as part of MP No. 8, so that a clear strategy for managing biodiversity may be attained.

-- Riparian and wildlife habitat

As discussed under 7(3)(a)(i) above, the Department of Fisheries and Oceans has expressed concern that the deduction to the timber harvesting land base for the protection of riparian habitat, as made in the analysis, is inadequate and, as discussed under 7(3)(a)(v) above, the Ministry of Environment, Lands and Parks has expressed concern that the timber supply analysis does not contain any specific assumptions for the protection of wildlife habitat. I expect these issues to be addressed in conjunction with the completion of the resource inventories discussed above. However, as indicated above in *Biodiversity*, I am satisfied from the results of both timber supply analyses, which show relatively stable and insensitive short-term timber supply, that in the short term, the amount of available timber can accommodate these integrated resource objectives and still allow harvest levels to be maintained as indicated in the base case harvest forecast, as discussed above under *Biodiversity*. Nevertheless, I expect riparian and wildlife habitat on the TFL to be protected through carefully planned and executed field operations in accordance with principles of sound forest stewardship.

-- Community water resources

There are four identified points of water consumption for domestic purposes within the TFL; three of which already have been logged and are subject to ongoing silvicultural activities. The other is the water of Cannery Creek used by South Moresby Lodge. Although no specific allowances were made in Western Forest Products' analysis for the protection of community water resources, such as a reduction to the timber harvesting land base or special forest cover objectives, I hold the licensee to its commitment to work cooperatively with South Moresby Lodge to protect the Cannery Creek water

source.

7(3)(a)(vi) any other information that, in his opinion, relates to the capability of the area to produce timber;

Timber supply profile

Areas considered to be growing sites of low and very low productivity according to the Western Forest Products ecosite classification system have been included in the timber harvesting land base. These areas are covered mainly by height class 3 cedar stands that, on average, never attain a diameter at breast height of 45 centimetres, and so are projected to be harvestable at 160 years of age. They currently represent 25 percent of the timber harvesting land base covered by mature stands, and 20 percent of the mature timber volume currently available for harvest. However, the proportion of harvesting carried out in these stands does not conform to this inventory profile; only 5 percent of the volume harvested and 5.8 percent of the area harvested between 1987 and 1991 were from sites of this kind.

Timber supply analysis for TFL 24 indicates that the initial harvest level is not sensitive to fluctuations in the harvest profile. However, if the present imbalance between the harvested profile and the profile of the growing stock persists, inevitably this will eventually begin to affect timber supply and the integrity of the base case forecast. I have therefore specified certain conditions in my approval letter regarding the need for increased performance in these lower productivity stands. I expect the harvest profile to be of greater significance in the determination of the next AAC for this TFL.

Twenty-year plan

The most recent 20-year plan prepared for TFL 24 was completed in the spring of 1993. This plan and associated operability mapping were not accepted by the Queen Charlotte Forest District for a number of reasons. Areas requiring unconventional harvesting methods were included in the conventional timber harvesting land base. There were also concerns that not all of the areas proposed for harvest are accessible or economically operable, and that cutblock size and adjacency did not comply with Coast Planning Guidelines. For these reasons, and in view of the age of the plan and its rejection by forest district staff, I have not considered the plan as part of this determination. The completion of a total resource plan, as discussed under section 7(3)(a)(v) above, should serve the purposes of the 20-year plan. If the findings from that exercise indicate unforeseen difficulties in the implementation of the AAC, this could lead to future AAC reductions and most certainly would be considered in the next Management Plan review, if not sooner.

7(3)(b) the short and long term implications to the Province of alternative rates of timber harvesting from the area;

Harvest flow

The nature of the transition from harvesting old growth to harvesting second growth is a major consideration in determining AACs in many parts of the province. In the short term, the presence of large volumes of older wood permits harvest levels to be sustained above long-term levels without jeopardizing the future timber supply. However, in TFL 24, the creation of the South Moresby National Park Reserve resulted in the removal of much of the forest land that was occupied by mature stands containing large volumes of wood. Combined with the previous pattern of harvest activity that

concentrated harvesting around logging camps in the northern half of the TFL, this resulted in the uneven distribution of age-classes discussed under section 7(3)(a)(i) above and in the current and projected initial harvest levels being below the long-term harvest level.

The Western Forest Products' analysis base case shows that due to the projected reduction in the amount of stands between the ages of 60 and 120 years, after the first decade, the harvest level must decline from the current level by 14 percent and remain at this lower level for 6 decades before increasing to the long-term harvest level after decade 7. Any increase to the initial harvest rate, or any attempt to maintain this level beyond one decade, will increase the timber supply shortage and result in a greater rate of decline in the mid term. The Forest Service base case indicates that the current harvest level must decline by 7 percent after the first decade, and by an additional 7 percent after the second decade, before the harvest level increases to the long-term harvest level.

The Forest Service analysis includes an alternative harvest forecast that examines a non-declining harvest flow. The forecast has an initial harvest level of 109 300 cubic metres per year, (a 5 percent reduction from the current harvest level), that remains constant until decade 7 when the harvest level begins to increase to the long-term harvest level in decade 8. Although this harvest forecast does not decline below its initial harvest level, it does forego the economic opportunities implied by the initial harvest level of the base case harvest forecast. In context of the social and economic objectives of the Crown, as discussed below, I consider to this be unnecessary, since I am satisfied that it is possible to accommodate the projected decline in harvest level without compromising good forest management. Furthermore, there are opportunities, as discussed under section 7(3)(d) below, to alleviate or avoid the projected timber supply shortfall.

Difference between AAC and actual harvest

Of the AAC, 10 335 cubic metres have been apportioned to the Small Business Forest Enterprise Program. However, no licences or permits have been issued to harvest this timber. Harvesting plans for two areas have recently been reviewed in preparation for the issuance of licences or permits to harvest this timber as part of the small business program.

Community dependence on the forest industry

Sandspit is the closest community to TFL 24 and a seasonal camp serving the TFL is located in Sewell Inlet. The majority of the employees associated with TFL 24 do not live on the Queen Charlotte Islands; however, about one quarter of the silvicultural activities that are undertaken on the TFL are conducted by Haida contractors.

7(3)(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities;

Timber processing facilities

Most of the wood harvested from TFL 24 is transported to Western Forest Products' mills located on Vancouver Island and the lower mainland. Western Forest Products' portion of the TFL 24 AAC represents less than 4 percent of Western Forest Products total mill requirements (3.2 million cubic metres per year); however, TFL 24 has historically provided some of the better quality wood processed

at these mills.

Although there are smaller operators in the Queen Charlotte Islands, there are only a few small mills. Most of the Small Business Forest Enterprise Program wood harvested to date has been shipped off the islands for processing.

7(3)(d) the economic and social objectives of the Crown, as expressed by the minister, for the area, for the general region and for the Province; and

Economic and social objectives of the Crown

-- Minister's letter

The Minister has expressed the economic and social objectives of the Crown for the province (letter dated July 28, 1994, attached as Appendix 3), and I understand these to apply to TFL 24. They are consistent with the objectives stated in the Forest Renewal Plan and include forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest level changes in a managed transition from old growth to second-growth forests, so as to provide for continuity of employment.

The Minister also stated in his letter that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability". He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that I consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. The latter would likely require the use of alternative harvesting systems, and to encourage this the Minister suggested I consider partitioned AACs.

I have considered the potential impacts on timber supply of commercial thinning, discussed under 7(3)(a)(iii) above; harvesting in previously uneconomical areas and forest types; aggressive investment in spacing of juvenile stands so that stands may reach harvestable dimensions sooner, as discussed under 7(3)(a)(iii) above; and the use of unconventional harvesting techniques, as discussed under 7(3)(a)(i) above. All of these opportunities may help to reduce the shortfall projected to occur in the next few decades. The economic viability of each opportunity, however, is uncertain. I have made specific comments in my letter approving MP No. 7 regarding these opportunities. I encourage the licensee during the term of MP No. 7 to explore the economic viability of these opportunities, in particular with relation to the South Moresby Forest Replacement Account and the Forest Renewal Plan. As discussed below under "Implementation of decision", this information and the resulting forest management strategy proposed in MP No. 8 are likely to be of great significance to the next AAC determined for this TFL.

-- Local objectives

Public review of MP No. 7 resulted in a number of concerns about management objectives for the TFL. The licensee should review these concerns and address them specifically in the preparation of MP No. 8 and in the public consultation associated with it.

Public input of direct relevance to this determination concerned mainly visual quality objectives, which I have discussed above, under *visually sensitive areas*. I am also aware of a number of comments, which I have considered above, under sections 7(3)(b) and 7(3)(a)(v), regarding the economic and environmental

significance of TFL 24 to communities within the Queen Charlotte Islands.

I have considered the input received and am mindful of the views which were brought forward. Where possible I have attempted in this rationale to respond briefly to those views, and the consideration of this input has been an important component of this determination.

-- First Nations

The TFL lies within the traditional territory claimed by the Haida and includes a number of archaeological sites including culturally modified trees. Designated archaeological sites on the TFL are protected under the Archaeological and Historic Sites Protection Act. MP No. 7 includes the commitment to notify the Heritage Conservation Branch and the Skidegate Band Council when any potential archaeological sites are discovered by field staff. MP No. 7 also includes the commitment to consult with the Skidegate Band Council to ensure any significant aboriginal sustenance activities on the TFL are fully recognized and accommodated in TFL management.

First Nations' review of MP No. 7 indicated a need to address the preservation of these archaeological sites as well as to ensure that visual quality is protected along water passages leading to the park reserve. As discussed below, under *visually sensitive areas*, the licensee has committed to preparing a plan for these areas.

The Council of Haida Nations operates a Forestry Unit that is closely involved in the planning and review of forest operations in the Queen Charlotte Islands.

7(3)(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Normal unsalvaged losses

MP No. 7 includes the commitment to conduct salvage operations when practical or as directed by the Regional Manager. MP No. 7 also commits to amending cutting plans in order to salvage timber blown down by the wind or infested or about to be infested by disease or insects. Notwithstanding these commitments, it is unlikely that salvage operations would recover all the damaged timber on the TFL. However, the Western Forest Products' analysis and MP No. 7 do not include any estimates of losses expected to occur as a result of fire, wind, disease or pest damage. I consider it extraordinary to project no losses of this kind, and as part of this determination, in order to account for losses that can reasonably be expected to occur, I have examined recent estimates of losses for a similar management unitthe Queen Charlotte TSA.

Together, losses from wind damage and insect infestations in the Queen Charlotte TSA were estimated to be about 1.6 percent of the projected harvest level. Since it appears that the incidence of windthrow and insect infestation in TFL 24 should be comparable to the incidence in this TSA, I consider it reasonable to estimate unsalvaged losses on TFL 24 to be between 1000 and 2000 cubic metres per year. This loss estimate represents a very small downward pressure on timber supply; and sensitivity analysis of mature stand volume estimates indicates that the initial harvest level is not sensitive to uncertainty of this magnitude. However, I have included certain conditions in my letter approving MP No. 7 to ensure that losses of this kind are better quantified and included in MP No. 8.

Reasons for Decision

This determination came into effect on April 30, 1995 and will remain in effect until a new AAC is determined, which must be completed within 5 years of the date of this determination. In my letter to the licensee of April 28, 1995, I approved MP No. 7 for TFL 24, for the period April 30, 1995 to December 31, 1999, with a number of conditions of approval that are also relevant to implementing this AAC determination.

In reaching my decision on an AAC for TFL 24, I have considered all of the factors presented above and have reasoned as follows.

Both of the timber supply analyses conducted for TFL 24 indicate that the current harvest level can be maintained in the short term and that, given current forest management practices and strategies, the existing shortage of stands between the ages of 60 and 120 years will result in a future timber supply shortfall that will necessitate a reduction in harvesting from current levels. Both analyses also indicate a long-term harvest level about one-and- one-half times the current harvest rate, which is a reason for optimism in the long-term.

As discussed under section 7(3)(a)(iii) above, information about a number of forest resources and attributes such as environmentally sensitive areas, conventionally operable areas, and visual quality objectives for TFL 24 is either lacking or is associated with considerable uncertainty. Although this causes me sufficient concern to have specified a number of conditions in my approval of MP No. 7 to remedy this situation, I am satisfied from the results of the timber supply analyses that even if the completion of the needed inventories results in considerable additional constraints on the amount of timber that is available for harvest, the short-term harvest level would not be affected. The timber supply analyses indicate that the timber supply in the first decade is relatively stable and insensitive to uncertainty in management assumptions. This gives me confidence that maintaining the current harvest level in the short term will not compromise principles of good forest management.

In spite of the current age-class distribution on TFL 24, I am encouraged by the opportunities this affords for alleviating the mid-term timber supply shortage that is projected in the timber supply analyses to occur approximately 40 to 60 years from now.

It is therefore my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years, that ensures IRM objectives can be met, that reflects current management practices, that avoids as far as possible both future curtailment of locally established patterns of socio-economic activity based on timber harvesting, and disruptive shortfalls in future wood supply, can best be achieved in this TFL at this time by establishment of an AAC of 115 000 cubic metres.

Implementation of Decision

Although this AAC is expected to satisfactorily accommodate forest management and socio-economic objectives during the period in which it will be in effect, further study and information are required before completion of the next management plan.

The completion of resource inventories and assessments of environmentally sensitive areas, wildlife habitat, stream classification, archaeological sites, biodiversity and total resource plans is required

before the next timber supply analysis as part of MP No. 8.

As well, the completion of studies regarding the ecosite classification system, as recommended by The Forest Service's Research Branch, is necessary before the next timber supply analysis is conducted, in order to reduce uncertainty with respect to the productivity of the land base.

Quantification of non-recoverable losses is also required so that they may be reflected with more certainty in salvage programs and management plan commitments.

I also encourage the licensee to examine the economic feasibility of unconventional harvesting methods and areas, deciduous harvesting activities, commercial thinning activities, and juvenile spacing, including its implications for minimum harvest ages. Information about these activities will allow consideration, in the next AAC determined for this TFL, of opportunities to alleviate future timber supply shortages.

The quality of information and the attention paid to the management regime proposed in MP No. 8 likely will form a clear juncture in the management strategy and consequent allowable harvest levels of TFL 24.

This determination comes into effect on April 30, 1995 and will remain in effect until a new AAC is determined, which must take place within five years of this determination.

Larry Pedersen

Chief Forester

Appendix 1: Section 7 of the B. C. *Forest Act*

The B.C. *Forest Act* section 7 reads as follows:

Allowable annual cut

7. (1) The chief forester must determine an allowable annual cut before December 31, 1996, and after that determination at least once every 5 years after the date of the last determination, for

> (a) the Crown land in each timber supply area, excluding tree farm licence areas and woodlot licence areas, and
>
> (b) each tree farm licence area.

(1.1) If, after the coming into force of this subsection, the minister

> (a) makes an order under section 6 (b) respecting a timber supply area, or
>
> (b) amends or enters into a tree farm licence to accomplish the result set out under section 33.1 (1) (a) to (d),

then, with respect to that timber supply area or tree farm licence area, as the case may be, the chief forester is not required to make the determination under subsection (1) of this section before December 31, 1995, or within 5 years after the last determination, but is required to make the determination

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(1.12) If the allowable annual cut for the tree farm licence area is reduced under section 7.1 (3), the chief forester is not required to make the determination under subsection (1) or (1.1) of this section at the times set out in subsection (1) or (1.1) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 7.1 (2).

(1.2) When the chief forester determines an allowable annual cut for a tree farm licence area, any management plan that specifies an allowable annual cut for that area is conclusively deemed to be amended so that the allowable annual cut specified in the management plan is the same as the most recent one determined by the chief forester.

(1.3) In determining an allowable annual cut under this section the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area,

(b) different types of timber and terrain in different parts of private land within a tree farm licence area, and

(c) gains in timber production on Crown land that are attributable to silviculture treatments funded by the Province, the federal government, or both.

(2) The regional manager or district manager shall determine a volume of timber to be harvested under a woodlot licence during each year or other period of its term, according to the licence.

(3) In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area;

(ii) the expected time that it will take the forest to become re-established on the area following denudation;

(iii) silvicultural treatments to be applied to the area;

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area;

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production; and

(vi) any other information that, in his opinion, relates to the capability of the area to produce timber;

(b) the short and long term implications to the Province of alternative rates of timber harvesting from the area;

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities;

(d) the economic and social objectives of the Crown, as expressed by the minister, for the area, for the general region and for the Province; and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Appendix 2: Section 4 of the Ministry of Forests Act

Section 4 of the *Ministry of Forests Act* (1978) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in the Province;

(b) manage, protect and conserve the forest and range resources of the Crown, having regard to the immediate and long term economic and social benefits they may confer on the Province;

(c) plan the use of the forest and range resources of the Crown, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the Crown and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in the Province; and

(e) assert the financial interest of the Crown in its forest and range resources in a systematic and equitable manner.

Appendix 3: Minister's July 28, 1994 Letter to the Chief Forester.

File: 10100-01

Jul 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than necessary to avoid compromising long-run sustainability.

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber

which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Signed by
Andrew Petter
Minister

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